IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

Patent Application

Inventors:	Govinda Nallappa Rajan	Case No.:	Rajan 2
Serial No.:	09/782,101	Group Art Unit:	2633
Filing Date:	February 12, 2001	Examiner:	Nathan M Curs

Title: Methods Of And Arrangements For Buffering Digital Optical Signals

DECLARATION UNDER 37 C.F.R. 1.132

I, Govinda Nallappa Rajan, of Huizen in the country of The Netherlands, do solemnly and sincerely declare as follows:

1) I received a Bachelor of Engineering (Honors) degree from Anna University, College of Engineering in Guindy, India in 1984. Before joining Lucent Technologies, I worked on research projects in medical technology in Erasmus University, Rotterdam, Netherlands, and Lenox Hill Hospital, New York, New York. Since 1998, I have been doing research and development in telecommunications as a member of the technical staff at Bell Laboratories, Lucent Technologies Nederland BV having an address of Larensweg 50, Hilversum, Netherlands, and being a subsidiary of Lucent Technologies Inc. My areas of research and development work at Bell Laboratories include Optical Networks architectures, data networks, security and self-organizing networks.

2) I am inventor of the above-referenced U.S. Patent Application.

3) I have reviewed U.S. patent 4,608,682 (Herein referred to as "Nagashima").I have reviewed the numbered paragraphs 1 to 5 of the US Patent Office Examiner's letter that includes the words "This action is made final" in respect of the above-referenced U.S. patent application.

4) In figure 3b of Nagashima, the injection current has to be maintained at or above ib to use the bi-stable properties (hysterises) of the laser. If the current is less than ib, then the upper stable level (B) cannot be reached. Specifically, as also shown in 3c, where the operation of the laser is shown by two input values Po and P1 while the injection current is maintained at ib, this means that if the input is high (P1), the laser reaches the stable state of B and then consequently when the input is low (Po) then the laser would indefinitely remain in the stable high state of B. The laser can only be reset to state A, by changing ib to io or lower.

5) Conversely in our invention, the region of injection current is maintained around io and ic of Nagashima fig 3b, where the gain and loss process just cancel each other. That means the laser is not allowed to enter into the stable upper level. So in our invention, if the input signal of a high value is removed the laser would return to the lower state after a finite period of time, i.e. **the laser in our invention is not allowed to reach the stable state.** So in our invention, the output value is valid only for a certain definite time period (named pre-determined retention time). The advantage is that when the laser has to be reset for the next signal time-period, the time taken to return to the lower state is much less than if the laser was in the upper stable level. This means that the switching times are much less than if the stable state of the laser was used.

6) Moreover, in our invention, the feedback is used to control the level of the injection current between io and ic, so that the laser is not allowed to enter into the stable upper level. The feedback mechanism also extends the pre-determined retention time, by controlling the injection current value to be in the region so as not to allow the laser to enter into the upper stable level and also not allow the laser to enter into the lower state (when the input is P1) thus extending the retention time of the signal.

7) In view of the above, I believe that, it would not be obvious to an engineer in this field studying Nagashima, that the bi-stable device as described in Nagashima can be used to develop memories for high-speed switching systems as described in our invention. The fact that Nagashima describes the use of bi-stable states of the device would mean that the time to reset the device would be much longer than if the device is kept in the upper level, but just below the stable state.

8) I Govinda Nallappa Rajan, herein certify that all statements made of my own knowledge are true and that all statements made on information and belief are believed to be true. I also understand that willful false statements and the like are punishable by fine, imprisonment or both under 18 U.S.C. 1001 and that willful false statements and the like may jeopardize the validity of the application-at-issue or any patent issuing thereon.

Executed on 22 August 2005 _____
Date

Govinda Nallappa Rajan